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10/519,965	12/27/2005	George H Brilmyer	116171.00014	5454

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EXAMINER	
MILLER, JR, JOSEPH ALBERT	
ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
12/24/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/519,965	BRILMYER ET AL.	
	Examiner	Art Unit	
	JOSEPH MILLER JR	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 10-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 10-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 14 and 15 are objected to because of the following informalities: claims refer to "a group consisting of". According to the MPEP 2173.05(h), a Markush is not indefinite if claim refers to "the group consisting of".

Claim will be interpreted for examination as reading "**the** group consisting of". Alternative methods of writing the claim include listing Markush elements in an alternative with the use of "or".

Appropriate correction is required.

Claim Observations

Claim 12 requires a second metal substrate to be formed into a useful article before the coating step – there is no metes and bounds indicating limitations on what makes a metal sheet a "useful article" or any limitation of what a "forming" step needs to entail. Furthermore, there is no claimed limitation on what the metes and bounds of "otherwise required" in regards to the heating step. The preparation of steel parts is well known to involve multiple heating steps.

Claim will be interpreted in broadest of contexts.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 5, 10, 11, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Blanchet-Fincher (5,948,465).

Blanchet-Fincher teaches a process for making a field emitter cathode including deposition a metal solution and heating the solution to reduce a metal (abstract).

Blanchet-Fincher teaches an example (Example 2, col 8, lines 10-60) where a metal substrate is formed by sputtering silver particles onto glass, a solution of silver nitrate is made and coated onto the silver coated substrate, and graphite (i.e. carbon) powder is applied over the solution-coated silver substrate; the prepared substrate is then heat treated in a reducing environment. The heat treatment includes heating and cooling in a reducing environment.

Regarding claim 1, all limitations of the claim are met. Multiple steps in the process could be considering cleaning steps, including the sputtering process in the argon atmosphere (which would inherently produce some Ar impacting the substrate surface) and the exposure of the surface to a solution including alcohol. The removal of

the solvent during the reduction process would complete the cleaning step; the step is not required by instant claim to be completed prior to the completion of the deposition.

Regarding claim 4, the thermal reduction is at 140 degrees Celsius, below the known melting point of silver.

Regarding claim 5, Blanchet-Fincher teaches the use of water or organic liquids as a solvent (col 3, lines 32-52).

Regarding claims 10 and 11, the solvent in example 2 taught by Blanchet-Fincher is silver nitrate and therefore contains nitrogen and oxygen.

Regarding claims 20 and 21, graphite powder is sprinkled over the solution covered surface. Instant claim states that the solution must additionally comprise carbon but does not specifically require carbon to be dissolved or even dispersed into the solution, Blanchet-Fincher clearly states that the graphite is sprinkled onto the "wet" solution.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Asano (4,235,947).

Asano teaches a method of forming a coated steel sheet (abstract). Asano teaches the cleaning of a steel substrate followed by the application of a metal solution. The metal solution coated substrate is then exposed to a heat treatment in a reducing atmosphere (col 3, lines 10-33).

Regarding claim 1, Asano teaches salts such as nickel acetate. Asano does not explicitly teach the step of cooling the substrate before removing from the reducing atmosphere, however, it is inherent that the substrate is eventually cooled and therefore it would be inherent and/or obvious to leave the substrate in the reducing atmosphere while at a temperature that oxidation could potentially occur. Since Asano teaches that the thermal decomposition occurs in the non-oxidizing gas condition (col 3, lines 46-48). Since thermal decomposition is NOT limited to a heating step (i.e. during any portion of a cool down phase, an elevated temperature would still produce a thermal decomposition), it is implied that at least cool down would occur within a reducing atmosphere (otherwise, if the substrate were removed it would be in the oxidizing environment of air).

It is noted that Asano teaches that the nickel compound is used to form Ni or NiO by thermal decomposition in the non-oxidizing gas condition (col 3, lines 39-47). Even though Asano allows for the formation of some nickel oxide he states that the heat treatment forms mainly "nickel" (col 3, lines 20-24) and therefore it is further inherent that exposure to anything other than the hydrogen/reducing environment is limited.

Claims 16, 17 and 19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ohmura (5,993,994).

Regarding claim 16, Ohmura teaches a surface treated (i.e. nickel-cobalt coated) steel sheet for use as a battery container (col 10, lines 45 – col 11, line 25). Regarding

the resistance measured, Ohmura teaches further coating the steel sheet and thereby producing a resistance of 1.8 m ohms after being heat treated. It would have been obvious and/or inherent that such a composite subject to a much greater temperature though for a shorter amount of time would produce a resistance that is below that of instant claim. The desire for a low contact resistance for the battery can is well known and if the resistance increased by around/more than three orders of magnitude from that measured by Ohmura.

Regarding claim 17, as indicated, Ohmura teaches forming a battery can.

Regarding claim 19, Ohmura teaches making an alkaline battery (inherently comprising an alkaline cell) with the battery can (col 11, lines 25-51).

Claims 1, 3-5, 10-16, 20, 22 - 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano (4,235,947) in view of Hirose (3,876,407); claim 4 further evidenced by Eaton (2008/0224881); claim 27 further evidenced by Yamazaki (2007/0252206).

Asano teaches a method of forming a coated steel sheet (abstract). Asano teaches the cleaning of a steel substrate followed by the application of a metal solution, such as nickel acetate. The metal solution coated substrate is then exposed to a heat treatment in a reducing atmosphere (col 3, lines 10-48).

Regarding claim 1, Asano does not explicitly teach the step of teach the step of cooling the substrate before removing from the reducing atmosphere.

Hirose teaches a method for producing a metal layer on a substrate (abstract). Hirose teaches covering a substrate with a compound such as a copper or silver sulfate or nitrate (col 2, lines 54-59) which is in the form of a liquid suspension or slurry (col 4, lines 27-36). Hirose teaches exposing the metal compound-coated substrate to a heat treatment which includes a reducing gas; the heat treatment includes a cool down of the coated substrate within the reducing environment (col 5, lines 12-29).

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the use of a cool down step in a reducing environment following the heat treating of a metal on a substrate in a reducing environment as taught by Hirose to the metal coating method of Asano because it would ensure continued reduction of the metal even after the heat source is turned off.

Regarding claim 3, the reduction taught by Asano is at 200 to 700 degrees Celsius (col 3, lines 19-21).

Regarding claim 4, the temperature range taught by Asano is known to be below the melting point of steel, as evidenced by Eaton. Eaton teaches that "steels have melting points in excess of 1,100 degrees Celsius" [0008].

Regarding claims 10 and 11, Asano teaches the use of acetates and nitrates (Table, bottom of col 5 and 6), thereby teaching anions comprising oxygen, nitrogen and carbon.

Regarding claim 12, it is obvious that some 'forming' method is used to create the steel sheet used as a substrate by Asano and as Asano uses this sheet as a substrate, it would meet the requirements of a "useful object". Regarding the thermal

reduction step, the heat treating would inherently drive remaining moisture from the surface, thereby performing an additional drying step.

Regarding claim 13, Asano teaches the use of a steel substrate.

Regarding claim 14, Asano teaches a nickel solution to form a nickel film.

Regarding claim 15, Asano teaches the use of chromium (Table 1).

Regarding claim 16, Asano teaches a "steel sheet" (title). As claim does not further limit "strip", sheet therefore reads on strip. In regards to the measure resistance and conditions applied to the strip, though Asano in view of Hirose does not explicitly teach the result of measuring the resistance of the strip and the strip displaying a resistance of 1.5 ohms under the conditions noted in instant claim, however, since the prior art and the present claims teach all the same process steps, the result of the resistance of the metal strip obtained by applicants process must necessarily be the same as those obtained by the prior art. Therefore by cleaning a surface of a metal substrate, applying a salt that has been dissolved into a solution and thermally reducing the coated surface, it must necessarily result in a measured resistance of less than 1.5 ohms after aging in an oven under listed conditions.

Regarding claims 20 and 27, Asano teaches the use of acetate solutions – it would be inherent that some, minimally trace, amount of carbon remains in the metal film. This is further evidenced by Yamazaki who teaches that nickel nitrate may be preferably used for a plating solution because nickel acetate solutions inherently contain carbon even after heat treatment [0056].

Regarding claim 22, Asano teaches the use of "steel". Using alloys of steel is well known and obvious in the art of steel. As written, claim requires the use of "an alloy of steel" and also a metal selected from the named group; claim does not specifically require the steel to be alloyed with the named metals.

Regarding claim 23, the variation of carbon content is well known in the use of steel, the use of a low carbon steel would be obvious to one of ordinary skill in the art for its increased strength.

Regarding claims 24 and 25, using metal plated (especially nickel plated) steel strips as battery cans/containers is a well known usage of steel. It is likewise well known to pre-form the battery can prior to plating (i.e. barrel plating). In fact, one of the known benefits of plating versus other metal deposition methods (such as sputtering, for example) is the ability to contact material at various portions of surfaces (and handle 'odd-shaped' substrates).

It therefore would have been obvious to someone of ordinary skill in the art at the time of the invention to use a battery can (comprised of a steel strip) instead of the steel strip as a substrate taught by Asano. The use of the pre-formed can reads on both claims 24 and 25 because claim 24 does not require a process order.

Regarding claim 26, forming an alkaline cell is a well known use of a battery can and it would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the use of the battery can formed by the nickel plated steel plate of Asano in view of Horise to the formation of an alkaline cell.

Claims 1, 12, 16-19 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmura (5,993,994) in view of Asano (4,235,947) and Hirose (3,876,407).

Ohmura teaches that a surface treated steel sheet can be used for battery containers (col 1, lines 7-12). Ohmura teaches that battery containers can be produced by any surface treated steel sheet mentioned as including a nickel layer formed as the uppermost layer (col 3, lines 17-23).

Ohmura does not specifically teach the steps of: cleaning the substrate surface, dissolving a salt of a metal in a solvent, coating that metal/solvent onto the substrate then heat treating the substrate in a reducing atmosphere, the heat treating include cooling down in the reducing atmosphere.

Asano teaches a method of forming a coated steel sheet (abstract). Asano teaches the cleaning of a steel substrate followed by the application of a metal solution. The metal solution coated substrate is then exposed to a heat treatment in a reducing atmosphere (col 2, lines 10-33).

Asano does not explicitly teach the step of teach the step of cooling the substrate before removing from the reducing atmosphere.

Hirose teaches a method for producing a metal layer on a substrate (abstract). Hirose teaches covering a substrate with a compound such as a copper or silver sulfate or nitrate (col 2, lines 54-59) which is in the form of a liquid suspension or slurry (col 4, lines 27-36). Hirose teaches exposing the metal compound-coated substrate to a heat

treatment which includes a reducing gas; the heat treatment includes a cool down of the coated substrate within the reducing environment (col 5, lines 12-29).

Therefore, Asano in view of Hirose teaches the steps of: cleaning a substrate surface, dissolving a salt of a metal in a solvent, coating that metal/solvent onto the substrate then heat treating the substrate in a reducing atmosphere, the heat treating include cooling down in the reducing atmosphere.

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the nickel plated steel sheet taught by Asano in view of Hirose to the battery can of Ohmura because one could apply the nickel plated steel sheet with a reasonable expectation of success as a battery can based on the known properties of nickel-plated steel and the requirements indicated by Ohmura that nickel-plated steel may be used as a battery container.

Though instant claim 1 does not require a battery can to be made, it does not limit the steps of the process or the usage of the finished substrate. One forming a battery can from nickel plated steel as taught by Ohmura would look towards the method of Asano in view Hirose as a known method of forming a nickel plated steel plate.

Regarding claim 12, it is obvious that some 'forming' method is used to create the steel sheet used as a substrate by Asano and as Asano uses this sheet as a substrate, it would meet the requirements of a "useful object". Regarding the thermal reduction step, the heat treating would inherently drive remaining moisture from the surface, thereby performing an additional drying step.

Regarding claim 16, Asano teaches a "steel sheet" (title). As claim does not further limit "strip", sheet therefore reads on strip. In regards to the measure resistance and conditions applied to the strip, though Asano in view of Hirose does not explicitly teach the result of measuring the resistance of the strip and the strip displaying a resistance of 1.5 ohms under the conditions noted in instant claim, however, since the prior art and the present claims teach all the same process steps, the result of the resistance of the metal strip obtained by applicants process must necessarily be the same as those obtained by the prior art. Therefore by cleaning a surface of a metal substrate, applying a salt that has been dissolved into a solution and thermally reducing the coated surface, it must necessarily result in a measured resistance of less than 1.5 ohms after aging in an oven under listed conditions. As stated in regards to claims above, it would be obvious to use the create a metal-coated steel strip as taught by Asano to be used in the battery of Ohmura.

Regarding claim 17, as indicated, Ohmura teaches forming a battery can.

Regarding claim 18, Asano and Ohmura teach the use of a nickel coated steel. Ohmura teaches the formation of a battery can. As explained above in response to claim 16, because the prior art and the present claims teach all the same process steps, the result of the resistance of the metal strip obtained by applicants process must necessarily be the same as those obtained by the prior art.

Regarding claims 19 and 26, Ohmura teaches that the battery cans include alkali (i.e. alkaline) battery cans/containers (col 1, lines 7-12). It is obvious/inherent that an alkali battery includes an alkali cell.

Regarding claims 24 and 25, Ohmura teaches that pre-forming a battery can prior to "barrel plating" is well known in the art (col 1, lines 15-45).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Diffenderfer (2,719,355) teaches a method of producing a coated metal product wherein the coated metal is kept in a reducing environment during cool down.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH MILLER JR whose telephone number is (571) 270-5825. The examiner can normally be reached Monday –Thursday, 7am to 3:45pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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